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ABSTRACT

Punctuation serves as a system of visual markers that contradict previously generated false grammatical expectations. Word order conditions define the redundant or critical aspect of punctuation cues to visual display. Parsing (grouping) sentences into meaningful phrases and clauses aids language comprehension, and children who have reading problems have often been shown to lack parsing skills. There is also evidence to suggest that visually marking subject, predicate, and phrase boundaries results in an improvement in children's reading comprehension. If text segmentation or end of line punctuation is related to an improvement in developing children's reading comprehension, it might be worthwhile to redesign some texts so that (1) modified terminal punctuation is used for beginning low ability readers, (2) punctuation is used to determine the boundaries between chunks of text, (3) printed intonation cues in texts are eliminated, (4) chunked text due to lack of space is not broken at right margin, and (5) line breaks are made between phrases or toward the end of the sentence. New technologies, specifically microcomputers and word processing software, can help children to become more cognizant of these language patterns that affect comprehension. (HOD)

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Evidence of the Cognitive and Metacognitive Effects of Punctuation and Intonation: Can the New Technologies Help?

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TO THE EDUCATIONAL RESOURCES

Evidence of the Cognitive and Metacognitive Effects of Punctuation and Intonation: Can the New Technologies Help?

This paper examines the research and literature relevant to investigating the effects of punctuation and other phrase boundaries, in prose and expository materials, on the intonation and resulting comprehension efforts of children (Note 1). Additionally, this paper will consider the question, "Is there evidence in the reviewed literature that the new technologies, such as microcomputers, could have an impact on helping children improve their comprhension of text?" Suggestions for text design and the designing of programmed software, based on the reviews, will be made (Note 2).

Punctuation and Intonation

Five major purposes of punctuation in written communication have been identified: (a) to terminate, (b) to combine and separate, (c) to introduce, (d) to enclose, and (e) to indicate omission. Cronnell (1980) indicates that because of the large number of punctuation rules, errors can be expected even among good writers. In his review of the literature, he found little research conducted in the teaching of mechanics of punctuation. Generally, it

seemed that introductory instruction begins with rules and correction of mispunctuated or unpunctuated sentences. The literature reviewed by Cronnell suggested that punctuation be taught functionally, as students need the instruction; however there were few suggestions as how to do this.

Punctuation, to some extent, provides the phrasing necessary for meaningful speech, but is a poor substitute for the degree of phrasing required in reading (Stevens, 1981). Gutknecht, Apol, and Morton (1982), from an analysis of second graders' miscues, determined that terminal punctuation and its location in text affects comprehension. Most second graders in the study comprehended more when they read standard texts in which punctuation appeared randomly at the end of each sentence. It was concluded that as readers become more proficient, location of terminal punctuation in text does not reduce comprehension. Readers at all levels should be exposed to random terminal punctuation. At the same time, Gutknecht found that less proficient readers comprehended more when reading modified texts. Modified texts in this study consisted of textual material restructured so that the terminal punctuation was always at the end of a line of text and the next sentence started on the next line.

The results of this study suggests that less proficient developing readers may need more structural cues.

Baldwin and Coady (1978) explored the relationship between punctuation and grammatical expectation using fifth graders as subjects. The children were given a manipulated text in which critical punctuation cues were varied depending on preceding word order: canonical sentences which confirmed the expectation of a particular grammatical pattern and non-canonical sentences which refuted the expectation of a particular grammatical pattern. The study was repeated using graduate students in linguistics as subjects and the results of both groups' performance was compared. There was a striking difference in the extent that children and adults utilized punctuation during reading. Both groups were not influenced by the presence or absence of punctuation in canonical sentences. Both groups demonstrated lowered comprehension with non-canonical sentences without punctuation. But the apparent difference occurred on punctuated non-canonical sentences. Adults comprehended these better: almost as well as punctuated canonical sentences. The fifth graders comprehended these no better than non-canonical sentences without punctuation. These readers appeared to ignore,

or failed to perceive, the purpose of punctuation, even when commas, question marks, and so forth, were syntactically critical. Baldwin and Coady extended their investigation further by studying 80 second to fifth graders'use of semi-noncanonical sentences. Ninety errors were made associated with commas and grammatical intonation at noun and main clause boundaries. Fifth graders performed no better than second graders. The studies dealt only with sentences, not general context, so it is still an open question as to how redundant or critical punctuation becomes in discourse where prior context may build up semantic expectation biases that influence attention to punctuation.

It seems likely that the major function of punctuation is to serve as a system of visual markers which contradict previously generated false grammatical expectations. Word order conditions define the redundant or critical aspect of punctuation cues to visual display. When sentences are non-canonical, punctuation seems essential in arriving at correct syntactic analysis, but when sentences are canonical, punctuation appears to reiterate grammatical information already provided by word order. Baldwin and Coady suggest that the rules of English punctuation established in conjunction

with traditional grammar are empty conventions which neither predict nor explain reading behaviors involving punctuation. As a result, Baldwin and Coady raise the question of whether punctuation as an active cue system can be considered for 10 year-olds, and by extension, elementary school children. An implication is that punctuation, as a cue system in reading, has a later onset. Another question that could be asked, is whether or not the late onset of punctuation utilization is due to maturation of the reader or lack of appropriate early instruction.

Read et al (1978) suggest that many beginning readers have difficulty comprehending what they read, even though they can identify the individual words in a written sentence, because they depend heavily on prosodic cues. Prosodic cues have a influence on oral reading and comprehension (Witte, 1980). If children can translate print into something resembling their own oral language, the retrieval of meaning will be accomplished with greater ease (Stice, 1978). Readers do not attend to all details before them on a page, but selectively attend to a sampling. Details selected are called cues because readers use then as a basis for making a guess as to the correct response (Vogel, 1975).

Words alone do not carry meaning until they are placed in the structural system of the English language. Intonation functions as a controller of meaning and provides more phrasing information to the reader for the purpose of organizing the words into meaningful units (Eisenhart, 1974; Stevens, 1981) Eisenhart states that readers must bring to the printed page, the ability to recognize the graphic cues that signal meaning. Graphic cues operate as a three part system: vocabulary, structure, and sound. The whole system should be taught non-technically to children at an early age as they are learning to read. Children already know a lot about language structure intuitively, so the signals are not new. She indicates that training in graphic cues has to be done in the context of meaning in reading not as part of a spelling or grammar lesson. Gutknecht et al state that changes in stress, pitch, or pause indicate the reader's anticipation with regard to expected grammatical structure. They list seven categories of intonation: (a) within words, (b) between words within a phrase of a sentence, (c) relative to phrase or clause structure of a sentence, (d) at termination of phrase or sentence, (e) where conjunction

is used in place of terminal punctuation, (f) direct quotes, and (g) no change.

Read et al (1978) observed that 7 year-old children correctly identified subject and predicate phrases with surprising accuracy. Poorer success was demonstrated when children were presented with sentences that contained misleading intonation contours. They seemed to be particularly dependent upon phrase-final lengthening as a cue signaling syntactic structure. The prosodic system, the rhythmic patterns of speech, consists of timed sequences of short and long syllable duration, accented and unaccented levels of stress, and the rise and fall of pitch--information readily available to the listener but missing when the listener becomes a reader (LeCoultre & Carroll, 1981). Martin and Meltzer (1976) conducted a study generated from the notion that if syllables were seen and heard as when spoken, it would help children make the connection between sequence of symbols seen and sequence of sounds heard. Their conclusion seemed to be that visual rhythm should improve ability to organize read sentences into well-structered wholes and facilitate fluency. Le Coultre and Carroll conducted a study to determine whether, as Martin and Meltzer predicted, visual syllable

duration pattern affected comprehension. The visual display in their study consisted of a slash for a long syllable, a triangle for a short syllable, an inverted triangle to indicate a pause and dashes for rhythm-pulse. They concluded that:

1. Visual rhythm gave children an advantage in ability to comprehend sentences. Their study could not clarify whether it was the duplication of speech rhythm or the nature of the visual display which aided comprehension.

2. The fluency effect described by Martin and Meltzer was not robust.

3. Any pattern not consistent with speech pattern would not aid comprehension.

Ehri (1976) conducted a study with second, third, and below grade level fourth graders using words printed in three sizes to correspond to the intonation patterns of the text. The intoned text was then compared with a standard text and a random text in which words were printed in different sizes and spaces were varied at random. Her results indicated that children trained to read intoned print did not outperform the standard print or random print groups. She concluded that printed intonation cues are useless to beginning readers.

Ahlvers (1970) conducted a study aimed at instructing first-graders in intonation skills in reading. There was no significant difference in overall reading comprehension between the experimental groups, receiving the intonation instruction and the control groups, not receiving the intonation instruction. However, on the oral Test of Intonation, when children were rated for appropriate use of pitch, stress, and terminal juncture, there was a significant difference between groups.

Means (1968) found that children who use fewer inappropriate intonation patterns in oral reading, comprehend better in oral and silent reading. Independent readers appear to use each element of intonation equally well. Witte (1980) indicated that by modeling correct intonation patterns orally, combined with students repeated reading practice, comprehension performance can be improved in the reading of passages silently. Flippo (1980, 1982) has emphasized the developmental quality of intonation in children.

Vogel and McGrady point out the importance of children internalizing the intonation or melody pattern of their native language for the development of syntax and for reading comprehension. They state that intonation is perhaps the

most important and least understood signaling system at the sentence level. Intonation's role in children's acquisition of reading behaviors and its relationship to instruction is evidenced by Coady and Baldwin's (1977) survey of Economy, Holt, Ginn, Houghton Mifflin, and Scott Foresman primers, in which they found difficult, confusing sentences with regard to intonation cues, and a virtually complete lack of guides for instruction in intonation in the teacher's manuals.

Flippo (1980) also examined the texts of major publishers of basal readers (Economy, 1980; Macmillan, 1975; Harper & Row, 1976; Rand McNally, 1974; Harcourt Brace Jovanovich, Bookmark, 1974, 1979; Scott Foresman, 1974; Houghton Mifflin, 1976; Holt, 1977). It was found that many of the second grade level basals examined, contained ending punctuation structure that could conceivably alter the meaning for unsophisticated primary grade children. Again, no suggestions were found in the teachers' manuals for children experiencing comprehension difficulties with the location of ending punctuation.

Because written language is devoid of intonation, the reader must reimplant the melody by utilizing clues that

punctuation and one's own background of oral language provide. Auditory memory does not appear to be a factor. Children seem to have the ability to internalize melody patterns as they relate to language acquisition, and of a foreign language as well, while adults do not. Clay and Imlach (1971) found that poor progress in reading could be interpreted as a failure to structure a very complex set of response hierarchies to intonation cues. Children who make fewer pauses tend to be the best readers. Better readers complete a sentence with fall in pitch. Poor readers pause more and are likely to use a rising or sustained pitch implying uncertainty. Good readers read seven words between pauses and 4.7 words per stress. Poor readers read 1.2 words between pauses and stress every word as in reading a list.

The findings of a study by Stice (1978) indicate that children who usually have the most success comprehending written language also have the most success comprehending oral contrastive stress in standard English. Conversely, lack of success in comprehension includes lack of success comprehending stress in standard English. Intonation as a significant part of language is a potential instructional element for improving what the developing reader needs to

know about language. She points out that several reading educators advocate teaching intonation patterns as part of the developmental reading curriculum. This would give readers a greater awareness of an additional signal system to indicate meaning. Reading, she maintains, is a matter of utilizing all the available cues to meaning. Intonation operates similarly across all dialects of English. Some strategies that could be used to affect cue selection in the structuring of meaning are listed:

1. Segment utterances into recognizable and manageable units;
2. Draw attention to special content;
3. Make contrasts with previously stated or inferred information;
4. Point out new material;
5. Confirm or negate a query;
6. Tag words, phrases, sentences according to type and function;
7. Indicate that pause can be signaled with a punctuation mark;

8. Indicate that context of passage and word placement in a phrase or sentence are aids to proper identification and meaning; and

9. Develop awareness of WH words as cues.

Beardsley (1982) supports the view that children make use of context cues according to age and ability (Flippo, 1980, 1982). If linguistic constraints within the text are to be of value to the reader, some consideration must be given to understanding which cues are likely to be the most useful at different stages of reading development. Beardsley's study indicates that the more useful cue for all readers, other than six to seven year old poor readers, was the proactive semantic constraint. In other words, the gist of the phrase following a deleted word in the cloze test gave the most help in determining what the missing word could be. Young readers seemed to have expectations of meaning from the material they read based on their experiences with language. The youngest poor readers predicted words to fit the syntactic structure of the material. This may be due to the fact that young readers are bound by the limits of their ability to take in only certain elements of the materials and may not have

interpreted the reading operation as a linguistic one. Good six year old readers and good and poor readers in the seven to eight year old age group showed that proactive and retroactive semantic cues were important information for interpretation.

Beardsley, and Clay and Imlach seem to agree that reading behavior becomes patterned close to the onset of instruction in ways determined by visual and linguistic quality of text; emphasis of the teacher and his/her methods; and the developmental status of the pupil in the visual, linguistic and cognitive areas. Approaches to instruction will inevitably influence the young readers' willingness to use what the material has to offer and the ability to integrate the different aspects of text. The studies so far outlined seem to argue well for approaches which base early reading materials on meaningful language without too rigorous an emphasis on the precise visual scanning of letters and words, and helping children become aware of words in relation to one another (Beardsley, 1982). They also support the idea that the key to reading lies in the child's own language and not in some standard model of English (Stice, 1978). These studies emphasize the importance of intonation as a controller

of meaning (Eisenhart, 1974), and also suggest that punctuation exerts a variable influence upon comprehension (Baldwin & Coady; Gutknect et al).

Phrase Boundaries and Text Structure

As children learn that prosodic cues are not preserved in writing, they begin to make better use of other kinds of signals that are preserved, such as semantic and contextual features (Schreiber, 1980). The key to fluency is grouping words together into meaningful sequences and beginning to understand that the purpose for reading is to extract the message that the written form communicates. Students who have difficulty providing meaningful phrases for words comprehend little. Even if they understand the words, they will not grasp the meaning of paragraphs unless they organize the words into meaningful units (Stevens, 1981). Poor readers read word-by-word rather than organizing their input into meaningful groupings, but when encouraged to group reading in a meaningful way, they are able to comprehend at a level comparable to that of good readers (Cromer, 1970). Once individuals have become proficient in the recognition of single words, they must progress to the notion that words occur in groups with a certain sense of patterning sequence

and meaning. If they do not, cautions Cromer, they may have overlearned word-by-word patterns of reading. These individuals can be instructed to change by artificially grouping words in a manner that is meaningful for them. Cromer recommended the following techniques to build phrase unit processing: (a) being read to in phrase units, (b) flashing groups of words too quickly for readers to read them word-by-word, (c) separating groups of words or phrases with slashes or spaces, and (d) printing beginning reading books in preestablished and meaningful word groupings which vary systematically the context in which words appear ("Look at Joe go." "Go look at Joe.").

Parsing (grouping) sentences into meaningful phrases and clauses is an essential step in language comprehension. Parsing difficulty is a common reading problem (Kleiman et al, 1979). Early and recent theories regarding how readers code items of information suggest that phrases or segments of written material, chunks, are the perceptual units of spoken and written language. Chunking sentences facilitates free recall of informaiton and promtoes rapid memorization of prose passages. Therefore, preorganization of reading materials into meaningful word groupings might improve efficiency

of reading as it has improved recall and memorization (Carver, 1970). Carver suggests that punctuation should be used to determine the boundaris between chunks of text and that chunked text should not be broken due to lack of space at right margins. Royer and Cable (1975) indicate that good readers may, in contrast to poor readers, organize what they read.

O'Shea and Sindelar (1983) determined that segmenting sentences assisted both low and high performance readers in comprehension as measured by a maze task. Segmentation of written discourse into meaningful units helps simplify the syntax of complex sentences. With units isolated, the reader is cued to the relationship among intrasentence phrases. They found that children who read slowly, but accurately, scored higher on segmented passages than on standard passages. There was no difference between standard and segmented passage performance for children who read with both high fluency and accuracy. Since segmentation aids young developing readers in comprehension, its use in the classroom would seem appropriate as a supplement to basic instruction. O'Shea and Sindelar segmented passages as follows: (a) subject and predicate of simple sentences were separated

and the object was also separated from the predicate; (b) noun modifiers, if short, were linked with nouns, and verb modifiers with verbs; (c) clauses were set off and if long, broken into appropriate thought units. They indicated that an alternative to retyping passages would be to use vertical lines of underlining. Students could help in the preparation of these segmented passages.

Goldman, Hogaboam, Bell, and Perfetti (1980) looked at the length of input segments related to recoding, or the transforming of material from short term to long term memory; sentence boundaries serve as cues to the individual to recode. They found differences between reading and listening. Boundaries are less important in reading because discourse is under reader control, the individual can reread and backtrack to re-encode, whereas in listening the speaker controls input. The study indicated that skilled readers retain encoded discourse of more difficult length longer than younger and less skilled readers. The latter used sentence boundary as a recoding cue only when relatively few words in an easy text had to be read. Demands of word recognition over lengthier and more difficult text produce

working memory overload, even within a sentence, for less skillful readers.

In order to help children understand that reading with expression means compensating for lack of prosodic cues in written text, Blum and Hoffman (1979), and Schreiber (1980) suggested drawing attention to the spacing between words as a kind of graphic device. While it only very occasionally provides evidence about phrasing, readers do observe white spaces between words, and through them can develop clarity about the function of spaces in defining written word boundaries. Exposure to meaningful print, they maintain, results in clarity about word space and skill in recognizing words.

There is also evidence in the literature to suggest that visually marking subject, predicate, and phrase boundaries should result in an improvement in children's reading comprehension. Weiss (1983) as part of his dissertation, investigated two methods of text segmentation to test this hypothesis. The results of this study support the theory that making the underlying oral phrase boundaries visible facilitates elementary school children's reading comprehension. Text segmentation is effective in helping elementary school

children comprehend text they are reading. Good, average, and poor readers, when reading material evaluated as "at or above grade level," did improve their reading comprehension when reading texts that were segmented along phrase boundaries. The theory could not be conclusively supported however, since this study did not directly compare oral discourse with the syntactic and pausal phrase formats in written discourse. Weiss points out that this would be an interesting area of future research. Findings of his study also indicated that less able readers performed at a level typical of average readers when reading a phrased difficult passage without teacher assistance. There was no evidence to suggest that phrasing easy passages would hinder good readers' comprehension. There is support for recommending that new social studies textbooks be written using the syntactic and pausal phrase format in presenting the content material. Weiss suggest that the children's comprehension would have shown even greater improvements if they had been trained to use the phrase segments beforehand.

Raban (1982) chose line-breaks, a feature of text display in books printed for young readers, as the focus for her research. Fluent reading requires that the reader discount

line endings which occur at any point in syntax without this affecting their reading comprehension or fluency. Research has found this to be the case with readers aged ten years and up whose eye-movements have stabilized. Cromer (1970) supported the notion that one source of comprehension difficulty could be attributed to a difference in the way in which the word groupings are arranged in the text. Raban felt there was a great deal of "impressionistic" evidence that line-breaks do cause difficulties to children when they are young and still learning to read. The difficulties, however, do not become apparent immediately, because children are mostly encountering sentences of less than one line in length; difficulties emerge as sentences increase in length. Teachers can be alerted to confusion possibly caused by line-breaks if children's reading is marked by various non-fluencies and self-corrections. In her study, Raban investigated children's reading of a text with line-breaks in every possible position, as frequently as possible within a Subject-Verb-Object-Adverbial sentence pattern. From the findings of her study, Raban concludes:

1. The solution to the problem of where to break the line in texts for young children is not straightforward.

Research points to the value of line-breaks both within and between phrases. Line-breaks within a phrase cause less disruption of fluency when they occur towards the end rather than near the beginning of the sentence. "And" should not occur at the beginning of a line. "And" and prepositions act as "signposts" in text.

2. More research is needed in the field, particularly to identify the hierarchy of elements of sentences like "and", so that publishers have alternatives with regard to line-breaking while preserving the integrity of sentence meaning.

The Raban research enhances the findings of Gutknecht et al (1982) and confirms the position of Flippo (1980, 1982). The effect of the location of ending punctuation in text on intonation and resulting comprehension is a developmental process and effects the unsophisticated and/or low ability early childhood reader. However, the more able/mature/and developed reader is not so affected by location of ending punctuation and line-breaks.

Cognitive and Metacognitive Effects

Metacognition refers to one's knowledge concerning one's own cognitive processes and products. It is involved

in comprehending what we know and knowing how to modify what we know, and it allows reading flexibility to occur. Better readers show metacognition during reading; poor readers do not, because they do not know when they have not understood and do not have a sense for how to modulate their activities to rectify their failure to understand (Guthrie 1982). Guthrie studied the reading behaviors of fifth grade subjects. The effective readers increased study time when presented with relatively difficult materials. Less successful readers did not regulate their study time in response to their misunderstanding; instead, they reduced their inspection time of the text material. According to Simpson and Lorsbach (1983), young children process print differently than older children. Older children and adults appear to process print with conscious attention and automatic activation. Young children process nonstrategically. As children become older, they become better able to use context deliberately to help process information. They learn to determine when such conscious attention is adaptive to the task and use it. Those strategies used to process information in memory show greatest change with age. However, those children that are not helped by a strategy, show little change. In experiments

conducted by Simpson and Lorsbach, . efforts in letter and word recognition in context and conscious attention to them changed considerably with age. The results of the study imply that there is facilitation of word recognition when a word is preceded by congruous context and inhibition of word recognition when a word is preceded by incongruent context.

Readence and Harris (1980) examined the so called prerequisite skills necessary for successful comprehension and the priority teachers should place on skills deemed essential to teaching comprehension. They feel that studies such as theirs are just the beginning steps in examining the sequence of skills notion in teaching of reading. False prerequisites are those skills which were unattained by 75% or more good readers in the study. Skills which may be necessary, but are not taught sufficiently for comprehension, are identifying possible outcomes, using punctuation clues, and understanding syntax. The skills were unattained by 10% of the good readers, and 50% or more by the poor readers. Skills associated with competency are identifying main idea, drawing conclusions, determining sequence, identifying pronoun

referents, and deriving meaning from context. All the good readers possessed these skills but few poor readers did.

Goodman and Burke's miscue analysis (1972) gives insight into how children regress, and lookback to fix up inconsistencies produced while reading, and highlights childrens' use of syntactic and semantic features. Research information on how children are effected by text structure, such as the information presented in this paper, coupled with factors of intellect, language background and ability, physical and emotional stability, allow children to make the most of the events and situations that enhance the transfer of learning. Teachers and publishers should become more aware of the importance that punctuation, intonation, and phrase boundaries have in children's reading comprehension. If text segmentation or end of line punctuation is related to an improvement in developing children's reading comprehension, it might be worthwhile to redesign some texts.

Implications for Text Design

The research and literature reviewed in this paper has provided some evidence to suggest the desirability of modifying textbook design for use with young developing unsophisticated readers. In summary those suggestions include:

1. Modified terminal punctuation should be used for beginning low ability readers (Gutknecht et al 1982).

2. Punctuation should be used to determine the boundaries between chunks of text (Carver, 1970).

3. Consideration should be given to the possibility of a syllable duration and visual rhythm display in texts (Le Coultre & Carrol, 1981).

4. Printed intonation cues in texts should be eliminated (Ehri, 1974).

5. Phrasing of text should be printed in meaningful units to facilitate elementary school children's reading comprehension (Weiss, 1983; Raban, 1982; O'Shea & Sindelar, 1983; Cromer, 1970; Stevens, 1981; Carver, 1970).

6. Do not break chunked text due to lack of space at right margin (Carver, 1970).

7. Make line breaks between phrases or towards the end of the sentence (Raban, 1982).

8. Do not use "and" or prepositions at the beginning of a line of print (Raban, 1982).

9. Sentences causing confused intonation should be eliminated from texts (Coady & Baldwin, 1977).

10. Information for dealing with intonation of text should be provided in the basals' teachers' manuals (Coady & Baldwin, 1977).

Can the New Technologies Help?

Technological devices such as films, television, computers, filmstrips, and slides have the potential within an instructional context to create graphic visualizations that encourage reading listening comprehension. This field, particularly the microcomputer part of it, is changing so rapidly that everyone involved is finding it hard to keep up with the advancements taking place in the technological laboratories and in the marketplace. Burke (1981) feels that making use of television and computers to stimulate reading depends on teacher inservice and knowledge of advances in the technologies.

Marsh (1983) ascertains that computer-assisted instuction (CAI) can present complications and cause confusions, but in spite of this, the techniques have conquered the world of business, science, math, and are in evident use in schools. He reviewed the findings of a number of CAI studies in reading at the elementary school level. Marsh summarized that:

1. Computer speed did not work fast enough to hold the interest of all students;

2. Audio reacted too slowly;

3. Quality of reading software was poor;

4. Teachers' and students' attitudes toward CAI were positive, but there was no indication that use of CAI would be more effective than traditional methods;

5. Not all the studies agreed about the value of CAI in reading;

6. Several studies found that primary boys gained more from CAI than from traditional programs;

7. Some studies suggested that culturally disadvantaged children would benefit from CAI;

8. One study noted a decline in social behavior;

9. Individualization and flexibility of instruction was high in CAI; and,

10. Cost was high.

Mason (1982) lists some advantageous features of computers and also some of their disadvantages. On the plus side:

1. Computers are interactive--print can change size, color, blink, and scroll.

2. Computers provide immediate feedback; they interact faster than the teacher with the student.

3. They are impassive, nonthreatening, and nonjudging.

4. Patterns change to remind the learner of the display, thereby focusing attention on the learning task.

5. The parameters can vary.

6. Skills can be embedded in game format.

7. Records can be kept.

On the minus side:

1. Equipment is costly.

2. Quality of display and programs are very variable.

3. Computers are dependent upon electricity.

4. Printouts often are not clear.

5. Computers provide limited display device.

6. Vision problems can occur.

The reviewed literature and research indicates that young unsophisticated beginning readers and low ability readers intonation and resulting comprehension is often effected by punctuation and other phrase boundaries in text. It is possible that the new technologies, specifically microcomputers and certain microcomputer software could have an impact on assisting these readers with comprehension

efforts. For instance, use of language experience techniques with a word processor could make children more aware of sentence structure, word groupings, phrase boundaries, and terminal punctuation. Also, voice activators and voice synthesizes could provide cues for intonation. Use of these components might make for an interesting research study in the area under consideration.

Word processing can be structured to attend to the Gutknecht et al (1982) findings. Beginning readers could be shown the "word wrap" capability of computer programs. Materials could be more easily rewritten and programmed so that the ending punctuation could be placed at the end of the line of text (Gutknecht et al, 198., Flippo, 1980,1982) and line breaks and phrasing could be put in appropriate chunks and locations (Carver, 1970; Raban, 1982; and others). Additionally the word processor could be used to prepare materials for miscue analysis (Goodman & Burke, 1972). This would facilitate easier use of miscue analysis in teacher and reading education. The study of miscue analysis could enhance teachers'understanding of punctuation, intonation, and other textual cues and miscues that effect cognition. As pointed out by Coady and Baldwin (1977) the teachers'

manuals do not attend to information pertaining to intonation miscues.

Most of the suggestions summarized as implications for text design, could be facilitated in the classroom by use of a word processor. Software could also be developed by reading researchers to enhance the intonation and comprehension success of beginning and less abled readers, as previously suggested, and this software could be made available for classroom use. Very little is available at this time, that could be endorsed. Marsh (1983) suggests that one of the most pressing needs in the microcomputer market is the development of quality software by reading experts.

Reference Notes

1. This review of the literature and research relevant to investigating the effects of punctuation, phrase boundaries, and line breaks in texts on intonation and comprehension, is an update of earlier reviews (Flippo 1980, 1982). This update was made possible by the work of Hazel Campbell (1984), one of my graduate students, who carried out the update under my guidance and direction.
2. The evidence of technological implications in the reviewed literature and research, and many of the suggestions for text design and use of microcomputers were from the paper by Hazel Campbell (1984), Prosodic, structural and technological influences in reading comprehension, a paper written under my guidance and direction.

References

Ahlvers, E. R. (1970). A study of the effect of teaching intonation skills on reading comprehension in grade one. Dissertation Abstracts International, 32, 297-A.

Baldwin, S. R., & Coady, J. M. (1978). Psycholinguistic approaches to a theory of punctuation. Journal of Reading Behavior, 10, (4), 363-375.

Beardsley, G. (1982). Context cues in early reading. Journal of Research in Reading, 5, (2), 101-112.

Blum, M. W., & Hoffman, J. V. (1979). A comparison of context useage by good and poor readers in word boundary tasks. In M. L. Kamil & A. J. Moe (Eds.), Reading Research: Studies and Applications (pp. 39-44). Clemson, SC: National Reading Conference.

Burke, M. (1981). Video Technology. Technological Horizons in Education, 8, (5), 57-58.

Campbell, H. (1984). Prosodic, structural and technological influences in reading comprehension. Unpublished paper.

Carver, Ronald P. (1970). Effect of 'chunked' typography on reading rate and comprehension. Journal of Applied Psychology, 54, (3), 288-296.

Clay, M. M., & Imlach, R. H. (1971). Juncture, pitch, and stress as reading behavior variables. Journal of Verbal Learning and Verbal Behavior, 10, (2), 133-139.

Coady, J., & Baldwin, S. (1977). Intonation and syntax in primers. Reading Improvement, 14, (3), 160-164.

Cromer, W. (1970). The difference model: A new explanation for some reading difficulties. Journal of Educational Psychology, 61, (6), 471-483.

Cronnell, B. (1980). Punctuation and capitalization: A review of the literature. Research in Education, March 1982 (ERIC Document Reproduction Service No. ED 208 404)

Ehri, L. C. (1976). Effects of printed intonation cues on reading in children. Research report in Research in Education, April 1977 (ERIC Document Reproduction Service No. ED 131 447)

Eisenhart, C. T. (1974, May). The structure of meaning-A linquistic description. Paper presented at the annual meeting of the International Reading Association, New Orleans, LA.. Research in Education, January 1975 (ERIC Document Reproduction Service No. ED 095 484)

Flippo, R. F. (1980). The effects of the punctuation/ textbook structure on the reading comprehension of elementary grade children. Proposal for grant submitted to the Teaching and Learning Research Grants Competition, National Institute of Education, Dept. of Health, Education, & Welfare, Washington, DC.

Flippo, R. F. (1982). The location of punctuation in the text and its effect on the comprehension of beginning readers: A position paper. Unpublished manuscript.

Goldman, S. R., Hogaboam, T. W., Bell, L. C., & Perfetti, C. A. (1980). Short-term retention of discourse during reading. Journal of Educational Psychology, 72, (5), 647-655.

Goodman, Y. M., & Burke, C. L. (1972). Reading Miscue Inventory manual: Procedure for diagnosis and evaluation. NY: Macmillan.

Guthrie, J. T. (1982). Metacognition: Up front flexibility. The Reading Teacher, 55, (4), 510-512.

Gutknecht, B., Apol, M., & Morton, W. (1982). Is what you see, what you get? Paper presented at Florida State Reading Conference, Miami Beach, FL.

Kleiman, G. M., & others. (1979). Prosody and children's parsing of sentences. (Tech. Rep. No. 123). Research

in Education, October 1975. (ERIC Document Reproduction Service No. ED 170733)

LeCoultre, Eleanor, & Carroll, Marie. (1981). The effect of visualizing speech rhythms on reading comprehension and fluency. Journal of Reading Behavior, 13, (3), 279-285.

Marsh, M. (1983). Computer assisted instruction in reading. Journal of Reading, 26, (8), 697-701.

Martin, J. G., & Meltzer, R. H. (1976). Visual rhythms: Report on a method for facilitating the teaching of reading. Journal of Reading Behavior, 8, (2), 153-160.

Mason, G. E. (1982, December). Advantages and disadvantages of the computer as a teacher of reading. Paper presented at annual meeting of the National Reading Conference, Clearwater Beach, FL.

Means, C. E. A study of the relationship between the use of intonation patterns in oral reading and comprehension in reading. Dissertation Abstracts International, 30, 4689.

O'Shea, L. J., & Sindelar, P. T. (1983). The effects of segmenting written discourse on the reading comprehension of low and high-performance readers. Reading Research Quarterly, 18, (4), 458-465.

Raban, B. (1982). Text display effects on the fluency of young readers. Journal of Research in Reading, 5, (1), 7-27.

Read, C., & others. (1978). Why short subjects are harder to find than long ones. Technical report No. 466. Research in Education, July 1979. (ERIC Document Reproduction Service No. ED 166671)

Readence, J. E., & Harris, M. M. (1980). False prerequisites in the teaching of comprehension. Reading Improvement, 17, (Spring), 18-21.

Royer, J. M., & Cable, G. W. (1975), Facilitating learning in connected discourse. Journal of Educational Psychology, 67, (1), 116-123.

Schreiber, P. A. (1980). On the acquisition of reading fluency. Journal of Reading Behavior, 12, (3), 177-186.

Simpson, G. B., & Lorsbach, T. C. (1983). The development of automatic and conscious components of contextual facilitation, Child Development, 54, (3), 760-772.

Stevens, K. C. (1981). Chunking material as an aid to reading comprehension. Journal of Reading, 25, (2), 126-129.

Stice, C. K. (1978). The relationship between comprehension of oral contrastive stress and silent reading comprehension. Research in the Teaching of English, 12, (2), 137-142.

Vogel, S., & McGrady, H. J. (1975). Recognition of melody Pattern in good and poor readers. Elementary English, 52, (3), 414-420.

Weiss, D. S. (1983). The effects of text segmentation on children's reading comprehension. Discourse Processes, 6, (1), 77-89.

Witte, P. L. (December, 1980). What research on prosodic cues might have to say about comprehension and automaticity theory. Paper presented at the annual meeting of the American Reading Conference, Sarasota FL. Research in Education, May 1981. (ERIC Reproduction Service No. ED 195945)